

IN THE SPECIFICATION

The paragraph beginning at page 2, line 12 has been amended as follows:

Clinical magnetic resonance spectroscopy is understood to be magnetic resonance spectroscopy using clinical magnetic resonance devices. The procedures of localized magnetic resonance spectroscopy differ from those of magnetic resonance imaging mainly in that, with spectroscopy, the chemical shift is ~~cancelled~~ resolved in addition to local tomographic ~~dissolution~~ resolution. Two localization procedures currently dominate clinical use. One procedure involves single volume techniques based on echo procedures, in which a spectrum of a previously selected target volume is recorded. The others are spectroscopic imaging procedures, so-called CSI procedures (Chemical Shift Imaging), which enable the simultaneous recording of spectra primarily of target volumes that are spatially connected.

The paragraph beginning at page 3, line 10 has been amended as follows:

The normally used single volume techniques are based on detecting a stimulated echo or a secondary spin echo. In both cases, a local resolution occurs by consecutive selective stimuli of three orthogonal slices. A target volume thus is defined by ~~a section~~ an intersecting volume of the aforementioned three slices. Only a magnetization of the target volume responds to all three selective RF pulses and thus contributes to the stimulated echo or secondary spin echo. The spectrum of the target volume is determined by one-dimensional Fourier transformation of the time signal corresponding to the stimulated echo or the secondary spin echo.

The paragraph beginning at page 3, line 18 has been amended as follows:

A hybrid CSI procedure is achieved by the integration of phase coding tables into a single volume technique. Compared to the single volume technique, the

hybrid CSI procedure within a volume of interest (VOC) (VOI) enables the selection of voxels. Since in slice selection the exact slice position depends on the resonant frequency of the stimulated spin ensemble, the area in which, e.g., fat is stimulated is shifted to the area in which water is stimulated. This phenomenon is called the chemical shift artifact. Some of the hybrid CSI procedures offer an adjustable parameter called frequency shift, with which it is possible to determine to which frequency the slice positioning should relate. For the selected frequency, the slice positioning is exact. With an increasing frequency spread, the shift increases linearly. Thus, with hybrid CSI procedures, it should be expected that magnetic resonance signals, which lie outside the selected frequency, can be absorbed in voxels in the border area of the volume of interest.

The paragraph beginning at page 5, line 8 has been amended as follows:

The aforementioned definitions and the underlying calculations ~~are~~ can be made in the control computer and/or sequence controller of the magnetic resonance apparatus.

The paragraph beginning at page 6, line 4 has been amended as follows:

The embodiment of the invention in Figure 1 shows an RF-pulse and gradient schema with idealized square-like gradient pulses 150 through 179 of a hybrid CSI procedure based on a secondary spin echo. In a time sequence, a slice-selective RF stimulus pulse 101 is emitted in a first direction in connection with a gradient pulse 150 of a gradient G_2 G_z a first selective RF refocusing pulse 102 is emitted in a second direction in connection with a gradient pulse 160 of a gradient G_x , and a second selective RF refocusing pulse 103 is switched in a third direction in connection with a gradient pulse 170 of a gradient G_y . The RF stimulus pulse 101 is

emitted such that it causes a flip angle of 90°. The selective RF refocusing pulses 102 and 103 each cause a flip angle of 180°. A local resolution within the section volume is achieved by a stepping of the phase coding gradient pulses 169 and 170 179 for each repetition of the illustrated sequence.

The paragraph beginning at page 7, line 11 has been amended as follows:

In accordance with the above description, Figure 3 shows the volume of interest VOI of the hybrid CSI procedure set by a user on a graphical user interface as the aforementioned section volume VS. The selection of the volume of interest VOI is performed, for example, based on an anatomical magnetic resonance overview image. The magnetic resonance device thereupon automatically declines ~~for~~ includes a saturation volume, extending around the volume of interest VOI in a two-dimensional manner, which prevents aliasing from the excited volume outside the volume of interest VOI into the volume of interest VOI during magnetic resonance excitation following saturation. The thickness of the saturation volume corresponds to the resonant frequency difference between water and fat, and the saturation occurs in particular in those directions in which the volume of interest VOI has a comparably large spatial expansion. Thus, in the 2D hybrid CSI procedure described as an example, the saturation takes place in both directions, orthogonal to the slice selection direction. In a 3D hybrid CSI procedure, as a rule, this should have taken place in all three directions, i.e. also in the slice selection direction of the 2D procedure. The saturation selection volume around the volume of interest VOI thus is divided into four bar-shaped volumes VB1 through VB4. Referring back to Figure 2, a saturation of the four bar-shaped volumes VB1 through VB4 described above is achieved by RF saturation pulses 111 through 114 and the related gradient

pulses 161, 162, 173, and 174, which are automatically set for the magnetic resonance device based on the aforementioned considerations without a further input by the user.